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Mass production of cellulase by *Bacillus subtilis* subsp. *subtilis* A-53

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*B. subtilis* subsp. *subtilis* A-53 hydrolyzing carboxymethyl cellulose (CMC) were cultured in the medium containing 2.0% (w/v) glucose, 0.25% yeast extract, 0.5% K<sub>2</sub>HPO<sub>4</sub>, 1% NaCl, 0.02% MgSO<sub>4</sub>·7H<sub>2</sub>O and 0.06% (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> at 30°C for 72 hr under aerobic conditions. The best carbon source and nitrogen source for the production of cellulase by *B. subtilis* subsp. *subtilis* A-53 were found to be rice hull and yeast extract. The highest production of cellulase was obtained when concentrations of rice hull and yeast extract were 5.0% (w/v) and 0.0% (w/v), respectively. Optimal initial pH of the medium and temperature for production of cellulase by *B. subtilis* subsp. *subtilis* A-53 were 6.8 and 37°C. Under these conditions, optimal agitation speed and aeration rate in a 7L bioreactor for the production of cellulase was found to be 400 rpm and 1.0 vvm.

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Production of cellulase by *Bacillus velezensis* A-68 isolated from the seashore of the Kyungsang Province in Korea

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More than three hundreds microorganisms to hydrolysis carboxymethyl cellulose (CMC) were isolated from the seashore of the Kyungsang province in Korea. Among them, twelve microorganisms showed relatively higher activity of cellulase. Activity expressed as a unit of cellulase by twelve microorganisms ranged from 35 to 110 unit with the liquid medium containing 2.0% (w/v) glucose, 0.25% yeast extract, 0.5% K<sub>2</sub>HPO<sub>4</sub>, 0.1% NaCl, 0.02% MgSO<sub>4</sub>·7H<sub>2</sub>O and 0.06% (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub> at 30°C for 72 hr under aerobic conditions. One of twelve microorganisms was identified by 16S rDNA sequencing and partial sequencing of gyrase A coding DNA as *Bacillus velezensis* and named as *B. velezensis* A-68. Optimal conditions for production of cellulase by this marine microorganism were investigated. The best carbon source and nitrogen source for the production of cellulase by *B. velezensis* A-68 were found to be rice hull and yeast extract. Activity of cellulase produced by *B. velezensis* A-68 with 3.0% (w/v) rice hull and 0.25% (w/v) yeast extract was 299.5 unit for 72 hr.